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Are Commodity Exports a Road to Weaker Institutions? Causal Inference through a Natural Experiment

Victor Lana, Lorena Costa, Leonardo Bornacki

Selected presentation for the International Agricultural Trade Research Consortium's (IATRC's) 2023 Annual Meeting: The Future of (Ag-) Trade and Trade Governance in Times of Economic Sanctions and Declining Multilateralism, December 10-12, 2023, Clearwater Beach, FL.

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2023 IATRC Annual Meeting

Clearwater Beach, FL

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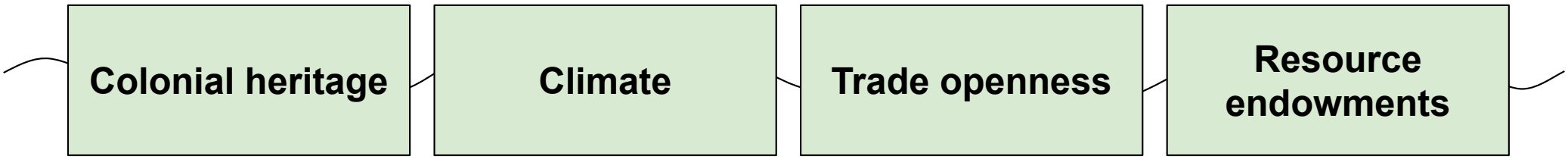
Introduction

- Researchers have investigated how institutions could affect long-term growth
- But we wanted to take one step back and try and understand the determinants of institutions



Introduction

- We also know that resource-rich countries tend to export relatively more agricultural products
- Then we argued whether the relationship between **resource endowments** and **institutions** would also hold for the association between agricultural exports and institutional quality

To investigate the causal effect of commodity exports on the institutional quality of a set of 49 countries between 1997 and 2022.

Identification strategy

- Endogeneity → Therefore, it is crucial to search for exogenous natural variations in commodity product exports in combination with econometric modeling techniques
- We use the accession of China to the WTO as a natural experiment to study the relationship between agricultural exports and institutions

Identification strategy

The accession of China to the WTO means that its imports would all face the same tariffs and barriers to trade

As a result, each country's commerce with China would be a reflex of its comparative advantages, not its political power (Chen, 2009)

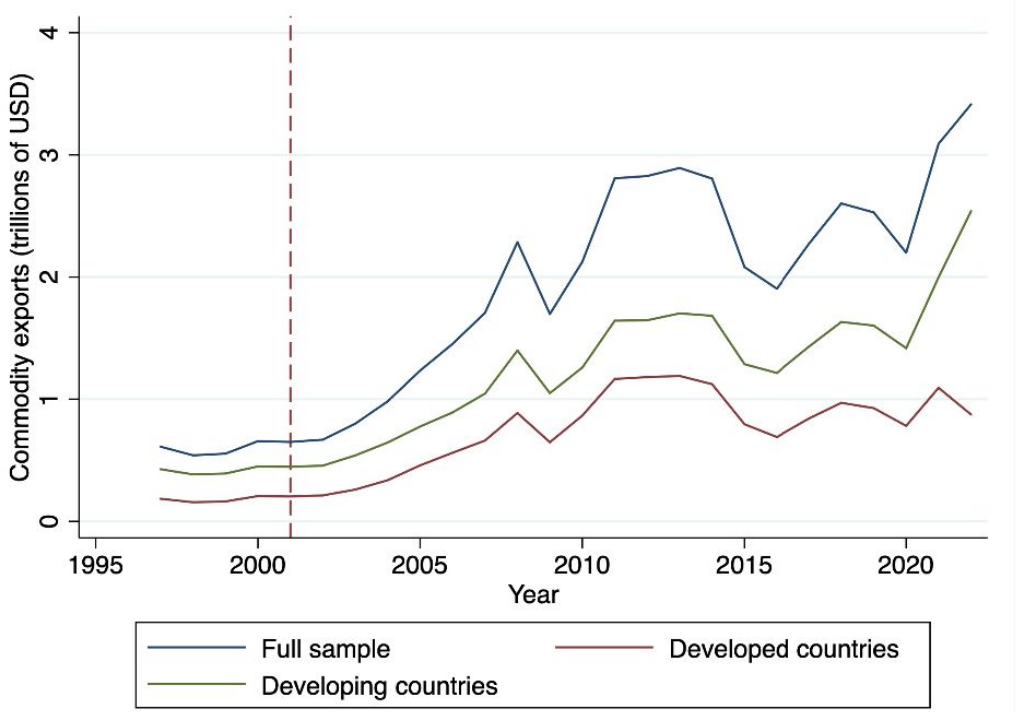


Figure 1. Aggregate commodity exports for full sample, developed, and developing countries between 1997 and 2022.
Source: Own calculations.

Empirical strategy

- Our model is:

$$Inst_{it} = \alpha_0 + \alpha_1 lnX_{it} + \sum \beta V + \varepsilon_{it}$$

- IV approach through the 2SLS. The first- and second-stage econometric models follow:

Exclusion restriction!

$$lnX_{it} = \lambda_0 + \lambda_1 lnchinaM_t + \sum \eta V + \upsilon_{it}$$

$$Inst_{it} = \alpha_0 + \alpha_1 ln\hat{X}_{it} + \sum \beta V + \varepsilon_{it}$$

Data

- Institutional quality – **World Bank WGI**
  - Voice and accountability; political stability and absence of violence; government effectiveness; regulatory quality; rule of law; and control of corruption
- Agricultural exports – **WITS**
- GDP, gini index, arable land, CO2 emissions, fertilizer consumption, R&D expenditure, and resource rent – **World Bank**
- Latitude and landlocked dummy – **CEPII**

Results

Table 1. Mean values of variables for countries that are more (or less) intensive in the exports of commodity goods

Variables	Net exporter of commodities?		Higher share of agricultural exports?	
	Yes	No	Yes	No
Voice and Accountability	0.58***	0.75	0.59***	0.74
Political Stability and Absence of Violence	0.09*	0.66	0.10^{NS}	0.60
Government Effectiveness	0.62*	0.83	0.71^{NS}	0.79
Regulatory Quality	0.64***	0.84	0.67**	0.82
Rule of Law	0.43***	0.77	0.49***	0.72
Control of Corruption	0.40***	0.69	0.46**	0.65
Average institutional index	0.46***	0.76	0.51**	0.72
Natural resources rent (% of GDP)	4.09***	1.77	4.58***	1.81
Latitude (degrees)	12^{NS}	14	15^{NS}	13
Landlocked (1 = yes; 0 = no)	0.07***	0.15	0.09**	0.13
GDP per capita (USD)	25907.34^{NS}	25393.77	26891.51^{NS}	25111.41
Gini (0% = perfect equality)	39.15***	36.24	39.6***	36.5
Arable land (ha per person)	0.35***	0.25	0.35***	0.26
CO2 emissions (metric tons per capita)	6.9***	5.7	7.3***	5.7
Fertilizer consumption (kg/ha of arable land)	273.48*	413.65	293.67^{NS}	395.67
R&D expenditure (% of GDP)	1.05***	1.43	1.11***	1.38
Observations	390	876	309	957

Note: ***, **, and * means are statistically different from the 'control' group at 1%, 5%, and 10%, respectively. NS means are statistically equal to the 'control' group. Institutional measures range from -2.5 to 2.5 (higher figures indicate higher levels of governance). Figures rounded to two decimal places.
Source: Own calculations.

Results

Table 2. First-stage regression results

Regressors:	Dependent variable: exports of commodities (USD)	
	(model 1)	(model 2)
Chinese imports of commodities (USD)	0.1584***	0.1372***
	(0.0273)	(0.0271)
Resources rent (% of GDP)	0.1741***	0.1712***
	(0.0130)	(0.0129)
Latitude (degrees)	0.0053***	0.0062***
	(0.0000)	(0.0013)
Landlocked (1 = yes; 0 = no)	-1.4256***	-1.3898***
	(0.0834)	(0.0860)
GDP *per capita* (USD)	1.2549***	1.3482***
	(0.0420)	(0.0483)
High-income country dummy		-0.2928***
		(0.0811)
Intercept	0.6505^{NS}	0.2814^{NS}
	(0.5299)	(0.5395)
Observations	1,225	1,225
R-sq	0.5525	0.5566
Adjusted R-sq	0.5507	0.5541
Partial R-sq	0.0266	0.0193
Robust F	33.6566	25.7289
Prob>F	0.0000	0.0000

Note: Robust standard errors in parentheses. ***p<0.001. NS non-significant. Exports of commodities, Chinese imports of commodities, and GDP *per capita* in log. Figures rounded to four decimal places.
Source: Own calculations.

Results

We rely the results of the identification and weak instrument tests, which confirm that that the Chinese demand shock serves as a relevant, strong instrument in our analysis.

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Source: Own calculations.

Results

Table 4. IV regression results

Dependent variables:	Endogenous regressor: exports of commodities (USD)				
	2SLS			OLS	
	(1)	(2)	(3)	(4)	(5)
Voice and Accountability	-0.0282^{NS}	-0.7865***	-0.6054***		
	(0.1548)	(0.1548)	(0.1477)		
Political Stability and Absence of Violence	-0.4281^{NS}	-1.9081**	-1.5678*		
	(0.3723)	(0.9681)	(0.8962)		
Government Effectiveness	-0.1110^{NS}	-1.5514***	-1.5869***		
	(0.1385)	(0.4224)	(0.4399)		
Regulatory Quality	-0.0203^{NS}	-1.1449***	-1.1379***		
	(0.0467)	(0.2173)	(0.2478)		
Rule of Law	-0.0131^{NS}	-1.2420***	-1.1776***		
	(0.0470)	(0.2266)	(0.2468)		
Control of Corruption	0.0657^{NS}	-1.1700***	-1.2342***		
	(0.0806)	(0.2979)	(0.3263)		
Average institutional index	-0.0891^{NS}	-1.301***	-1.2183***	0.0909**	-0.1327*
	(0.0880)	(0.2898)	(0.2966)	(0.0425)	(0.0702)
High-income country dummy	No	No	Yes	No	Yes
Control variables	No	Yes	Yes	No	Yes
Observations	1,266	1,225	1,225	1,266	1,225

Note: Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1, and NS non-significant. Exports of commodities in log. Columns 1, 2 and 3 report the second-stage regression results without controls or the high-income country dummy, with control variables and no control over income structure, and with controls and high-income country dummy, respectively. Columns 4 and

Results

Table 6. IV regression results: disaggregated exports

Endogenous regressor: exports (USD)	2SLS Dependent variable: average institutional quality				
Animals	-2.1680**				
	(0.8427)				
Vegetables		-0.6561***			
		(0.1211)			
Foods			-1.1506***		
			(0.2463)		
Minerals				-1.3171***	
				(0.4506)	
Fuels					-2.4907^{NS}
					(1.5905)
Intercept	-2.5420^{NS}	-0.7736^{NS}	-1.7862^{NS}	-3.4636***	-16.0499**
	(1.6186)	(1.2227)	(1.1659)	(1.2789)	(7.4661)
High-income country dummy	Yes	Yes	Yes	Yes	Yes
Control variables	Yes	Yes	Yes	Yes	Yes
Observations	1,224	1,225	1,225	1,225	1,225
Wald chi2(5)	41.52	511.2	275.57	66.28	17.34
Prob > chi2	0.000	0.000	0.000	0.000	0.000

Note: Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1, and NS non-significant. Exports in log. Control variables are natural resources rents; log of per capita GDP; latitude, and the landlocked dummy. Figures rounded to four decimal places.

Concluding remarks

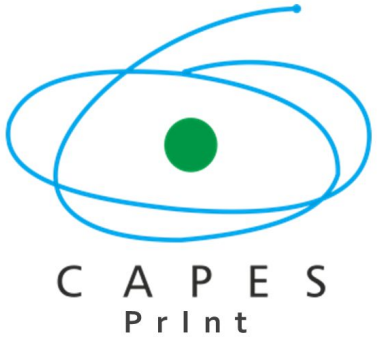
- We underscore the far-reaching **impact** of variations in agricultural exports on a country's institutional landscape.
- Policymakers in commodity-exporting countries should be conscious of the potential **trade-offs** between economic gains from exports and the quality of their institutions

Concluding remarks

- While resource exports can boost revenues, they may also lead to institutional deterioration, affecting governance, public services, and political stability
- Thus, governments might consider the adoption of measures to mitigate these adverse effects, such as transparent revenue management, diversification of their economies, and robust regulatory frameworks
- **Cattle farming**, for instance, requires special attention due to its resource-intensive nature and the lobbying power of producer groups. Conversely, **vegetable exports** may warrant more relaxed regulation.

Acknowledgements

Thank you for your attention.



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